

**BASIS FOR THE AMENDMENT**

Claims 3, 13, and 20 have been canceled. The remaining claims have been amended to correct minor informalities.

Claims 22-25 have been added as supported by Claims 10 and 17, respectively.

No new matter is believed to have been added by entry of this amendment. Entry and favorable reconsideration are respectfully requested.

Upon entry of this amendment Claims 1, 4, 5, 10-12, 14-19 and 22-25 will now be active in this application.

**INTERVIEW SUMMARY**

Applicants wish to thank Examiner Nguyen for the helpful and courteous discussion with Applicants' Representative on May 23, 2005. During this discussion it was noted that the Examiner has recognized that U.S. 6,107,226 has no disclosure of the choline chloride absorption or the ratio of DBP/choline chloride absorption. However, she has taken the position that the precipitation of silica in the '226 patent is carried out by a similar process as in the present invention. As a result, the Examiner is of the opinion that the silica of the '226 patent has the same choline chloride absorption and DBP/choline chloride absorption ratio as the silica of the present invention. Applicants disagree and provide a detailed explanation below.

The Examiner also thinks a constant alkaline number is inherent because a constant pH value is used in the method. Applicants disagree and provide a detailed explanation below.

Claims 3, 13, 20 have been canceled as requested by the Examiner.

**REMARKS**

Applicants respectfully request reconsideration of the application, as amended, in view of the following remarks.

The present invention as set forth in **amended Claim 1** relates to a precipitated silica having a DBP absorption of from 100 to 450 g/100 g, a choline chloride absorption of from 150 to 400 g/100 g (75% absorption by weight aqueous solution); and a DBP/choline chloride absorption of less than 1.07.

**Amended Claim 10** relates to a process for preparing precipitated silica having the above properties, comprising, inter alia, simultaneously metering into an aqueous silicate solution more aqueous silicate solution and a Lewis and/or Brønsted acid to provide a mixture, **wherein the metered addition of the aqueous silicate solution and the Lewis and/or Brønsted acid is carried out while maintaining a constant alkali number in the mixture of at least 1.**

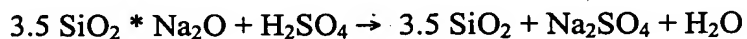
**Amended Claim 17** relates to a process for preparing precipitated silica having the above properties, comprising, inter alia, simultaneously metering into a vessel an aqueous silicate solution and a Lewis and/or Brønsted acid to provide a mixture, **wherein the metered addition of the aqueous silicate solution and the Lewis and/or Brønsted acid is carried out while maintaining a constant alkali number in the mixture of at least 1.**

In contrast, Chevallier (US 6, 107,226) fails to disclose or suggest a precipitated silica and processes as claimed. In particular, the product of Chevallier cannot have the claimed choline chloride absorption and the ratio of DBP/choline chloride absorption.

The examiner asserts that precipitation at constant pH is equivalent to precipitation at constant alkali number. Applicants disagree.

In the following, Applicants explain in detail the differences between pH-controlled and alkali-number-controlled precipitations. To be able to understand the said differences, it is first necessary to understand the basic principle of each precipitation.

The basic principle of each precipitation is described by the following equation:



In the ideal case, 1 molecule of  $\text{Na}_2\text{O}$  reacts with 1 molecule of  $\text{H}_2\text{SO}_4$ . In reality, however, this does not happen. "Side reactions" must be considered here. For example, at the instant at which the  $\text{SiO}_2$  particles are formed, some " $\text{Na}_2\text{O}$ " molecules can become included in the interior of the particle or fixed in the pores. This leads to the need to distinguish between four types of  $\text{Na}_2\text{O}$  molecules:

- a)  $\text{Na}_2\text{O}$  molecules that have reacted with  $\text{H}_2\text{SO}_4$  to form  $\text{Na}_2\text{SO}_4 + \text{H}_2\text{O}$ ,
- b)  $\text{Na}_2\text{O}$  molecules that are included in the  $\text{SiO}_2$  particle,
- c)  $\text{Na}_2\text{O}$  molecules that are fixed in the pores or on the surface of the  $\text{SiO}_2$  particles,
- d)  $\text{Na}_2\text{O}$  molecules that remain as soluble silicate in the suspension.

The  $\text{Na}_2\text{O}$  molecules cited under a) no longer exist as  $\text{Na}_2\text{O}$  molecules, but have reacted and can be analyzed by determination of the  $\text{Na}_2\text{SO}_4$  content. The remaining  $\text{Na}_2\text{O}$  types (b to d) are present unchanged as " $\text{Na}_2\text{O}$ " and can be determined (analyzed) as follows:

Measurement of the pH:

In the measurement of the pH of a precipitation suspension, only the  $\text{Na}_2\text{O}$  molecules according to (d) are detected, or in other words the "free  $\text{Na}_2\text{O}$  concentration".

Measurement of the alkali number:

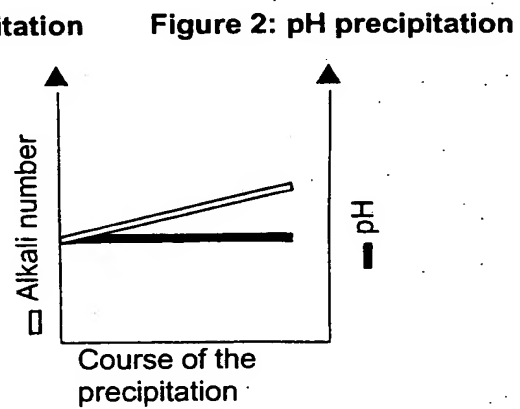
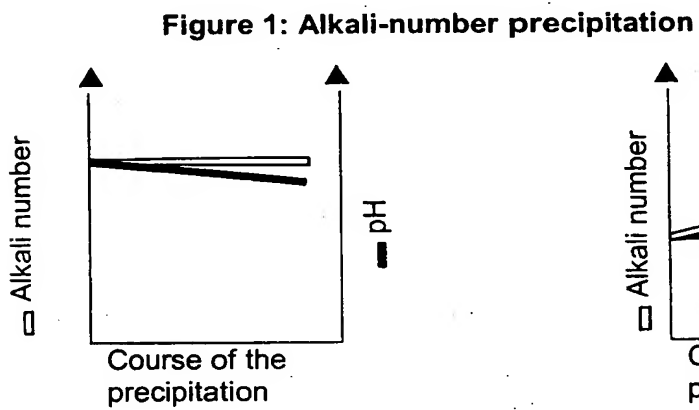
In determination of the alkali number, the "free  $\text{Na}_2\text{O}$  concentration" (d) and in addition the  $\text{Na}_2\text{O}$  molecules fixed in the pores or on the silica surface (c) are detected.

Elemental analysis:

Finally, by means of elemental analysis, it is possible to determine, besides the “free  $\text{Na}_2\text{O}$ ” (d) and the  $\text{Na}_2\text{O}$  bound on the silica surface (c), the  $\text{Na}_2\text{O}$  molecules that are included inside the silica (b). In this way, therefore, all  $\text{Na}_2\text{O}$  molecules according to b), c) and d) are detected.

Different precipitation methods are named for the parameters that are maintained constant. Thus, in pH precipitations, the pH ( $\text{Na}_2\text{O}$  type d) is constant during precipitation, while in alkali-number precipitations the alkali number ( $\text{Na}_2\text{O}$  types c + d) is constant.

The following diagrams illustrate the difference between the two precipitation methods:



**Figure 1** schematically represents an inventive precipitation at constant alkali number (alkali-number precipitation). In this method, more  $\text{Na}_2\text{O}$  is included in the  $\text{SiO}_2$  matrix of the silica particles or is bound at the silica surface and in the pores ( $\text{Na}_2\text{O}$  type (c)) as the alkali number becomes higher.

Since both the (c) and (d) types of  $\text{Na}_2\text{O}$  are detected in determination of the alkali number and their sum remains constant, this leads – considering the fact that the number of  $\text{Na}_2\text{O}$  molecules bound at the silica surface (c) increases – to the situation that the number of free  $\text{Na}_2\text{O}$  molecules (d) decreases in the course of precipitation.

**Figure 2** schematically illustrates a typical pH precipitation according to Chevallier. Here also, the  $\text{Na}_2\text{O}$  concentration in solution and the  $\text{Na}_2\text{O}$  included in the  $\text{SiO}_2$  matrix of the silica particles or bound at the silica surface increase as the pH becomes higher. Since the pH detects only type (d)  $\text{Na}_2\text{O}$  and the concentration of this type is supposed to remain constant, progressively more  $\text{Na}_2\text{O}$  relative to  $\text{H}_2\text{SO}_4$  must be added in the course of precipitation. Consequently, the alkali number, or in other words the sum of the  $\text{Na}_2\text{O}$  molecules of types (c) + (d), increases in the course of precipitation.

Figures 1 and 2 illustrate the fact that pH-controlled and alkali-number-controlled precipitations are fundamentally different precipitation methods. This means on the one hand that the ratios of water glass to sulfuric acid must be adjusted differently and on the other hand that the reaction medium in which the silica agglomerates grow is completely different. This in turn leads to the situation that silicas with completely different properties are obtained depending on precipitation method. The examiner's assertion that the precipitation methods of Chevallier and of the invention are similar and that the silicas therefore have the same properties therefore lacks any foundation.

A further substantial difference between the precipitation methods of Chevallier and of the present invention is the number of precipitation steps.

The method of the present invention is a **one-stage method**. Thus water glass and acid are simultaneously added to a receiver containing water + water glass. After the precipitation, the reaction is ended by addition of further sulfuric acid (see page 5, "general experimental protocol").

In contrast, the method of Chevallier is a **two-stage precipitation**. Thus, in a receiver containing water glass, there is first added an acidifying agent, leading to a first precipitation (see column 3, lines 37 to 63). After this first step, a reaction mixture containing both precipitated silica (in the form of "growth nuclei") and unreacted water glass is formed. This reaction mixture is used in Chevallier as the receiver solution for the second precipitation step, in which water glass and acid are added simultaneously (see column 3, lines 64 to 67).

The precipitation methods of Chevallier and of the invention therefore also differ in terms of the receiver solution. Chevallier uses a receiver solution containing "silica growth nuclei", whereas, in the method of the present invention, only water glass and water are present in the receiver. It is easy to understand that precipitation in a receiver containing growth nuclei leads to products different from those obtained by precipitation in a receiver solution of water glass.

In summary, the methods described in Chevallier and in the present invention are fundamentally different precipitation methods. The two methods must necessarily lead to different products. Thus, the product of Chevallier cannot have the claimed choline chloride absorption and the ratio of DBP/choline chloride absorption.

Therefore, the rejection of Claims 1, 4-5, 10-12, 14-19 under 35 U.S.C. § 103(a) as being unpatentable over Chevalier (US 6, 107,226) is believed to be unsustainable as the present invention is neither anticipated nor obvious and withdrawal of this rejection is respectfully requested.

Application No.: 10/079,479

Reply to Office Action dated: April 21, 2005

In this connection, Applicants note that in the corresponding Taiwanese application the rejections based on Chevallier were withdrawn and a patent was granted.

The rejection of Claims 3, 13 and 20 under 35 U.S.C. § 112, 1<sup>st</sup> paragraph, is moot in view of the cancellation of these claims.

Even though the Examiner has clearly considered the reference filed February 25, 2005, as chevalier is used for the present rejection, Applicants still would appreciate if the Examiner could forward an initialed, signed and dated Form PTO 1449. For the Examiner's convenience a copy of **Form PTO 1449 as filed on February 25, 2005**, is attached herewith.

This application presents allowable subject matter, and the Examiner is kindly requested to pass it to issue. Should the Examiner have any questions regarding the claims or otherwise wish to discuss this case, he is kindly invited to contact Applicants' below-signed representative, who would be happy to provide any assistance deemed necessary in speeding this application to allowance.

Respectfully submitted,

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Norman F. Oblon

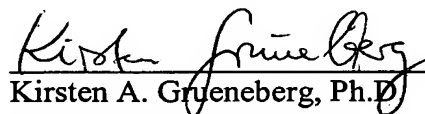
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